



Review of the literature on Pastoral Economics and Marketing:

West Africa

Report prepared for the World Initiative for Sustainable Pastoralism, IUCN EARO by Dr
Abdrahmane Wane, URP Pastoralisme – PPZS (Pôle Pastoral Zones Sèches), Dakar,
Senegal. 2006

Table of Contents

Introduction	1
The current trends of pastoralism in the context of Sahelian economies.....	2
Monographs on the pastoral systems of Sahelian countries.....	2
The case for pastoralism	8
The challenges of the economy of pastoralism.....	15
The challenges facing pastoral development	15
The usefulness of conducting statistics backed economic studies.....	17
Bibliography	18

Introduction

In many Sahelian countries, pastoralism is at the same time a production activity and a way of life. It may be construed as an occupation stemming from a true vocation (Baxter, 1994); and it intertwines several factors bearing on anthropology, sociology, environment, and economy. As such, it is difficult to define it from an exclusively economic perspective. Numerous tentative economic definitions of pastoralism exist, and they all refer to the contribution from Swift (1988), who defines pastoral production systems as “ones in which at least 50% of the gross incomes of households (e.i., the value of market production and the estimated value of subsistence production consumed by households) come from pastoralism or its related activities (for instance caravan trade), or else, where more than 15% of households’ food energy consumption involves the milk or dairy products they produce.”

Like many others, Morton and Meadows (2000), and recently the UNDP (2004) have provided definitions of pastoral economy with reference to Swift’s contribution.

For long, pastoralism has been the subject of a number of myths and misconceptions: a practice of another era founded on mobility, it deteriorates the environment; its actors are contemplative and conservative; its activities are archaic, backward, useless, irrational, disrupting and most of all economically inefficient, and its contribution to the national economy ill-defined, etc. Some such clichés remain very much alive in our own time.

In the face of such biases, one of the main objectives of economic research on pastoral systems is to rigorously examine the viability of the systems and the potentials for increasing their performance (efficacy and efficiency) in a sustainable manner. The ultimate goal is both to increase productivity without deteriorating the environment and to increase pastoralists’ standard of living. Seeking to increase the performance of the pastoral system through pastoral system research based strategies generates costs and benefits. It is therefore important for development geared research, and its related interventions, to be, not just technically feasible and socially acceptable, but also economically viable.

However, analyzing the economic performance of pastoral activities requires a clear identification of the objectives of pastoral production. Generally, this has two main objectives. The first objective posits that the ultimate finality of pastoral activity is to produce milk and meat products that are marketable on national and international markets. The second asserts that the true vocation of pastoralism is to feed pastoralists, and therefore to guarantee their food security. Combining the two objectives to improve both the performance of pastoral activity and pastoralists’ income would be ideal. In practice, the general trend is to make pastoral production meet the needs of national demands, and in the best cases, extra border ones. Whatever the case, choosing any of the two objectives stated above would determine the type of economic evaluation to conduct.

The present document aims to present the main current and future trends of pastoral economy. It seeks to collect and document any pastoral economic information within a panel of Sahelian countries (Burkina Faso, Mali, Mauritania, Niger, Senegal, and Chad), and to provide is a list of resource persons and organizations for possible collaboration on pastoral economy related issues. The study utilizes some publications and grey literature, and identifies the directions toward which development related research could and should move, in terms of economic and marketing studies on pastoralism. Such studies should demonstrate the usefulness of economic evaluation as a decision making tool and as an economic argument to obtain appropriate policies for pastoral production systems.

Like most developing countries, the countries in our panel are scarce in terms of quantitative economic studies specifically bearing on the evolution of pastoral economy, and focusing on its intrinsic performance and on the efficacy of the livestock marketing system. Statistics backed systemic study is still rather embryonic.

However, it appears that a number of organizations and research-development institutions are developing new approaches, thus contributing to the production of knowledge in the area of pastoral economy. For instance, as of end 2004, working in partnership, a research unit team known as PPZS, resolutely started a vast study on the economic contribution of dry land pastoralism. This orientation is novel in the Sahelian zone, where there is practically no comprehensive census of the livestock (excepting the very controversial one carried out in 1989 through ENEC in Burkina; while in Chad such a study is only planned for 2007, with the

support of the FAO). This explains why the present study extensively refers to examples from Senegal, to the detriment of the other countries.

Our study has two main parts: the first describes the current trends of pastoralism and contextualizes them in the economic situations of the Sahelian countries. The second is prospective, and therefore presents the future trends.

The current trends of pastoralism in the context of Sahelian economies

To contextualize pastoral development means to avoid considering pastoralists' activities as totally disconnected from other economic sectors. I therefore first present the situation analysis of pastoral livestock systems, while briefly recalling the macro-economic frame of the countries being studied. Second, I provide a line of arguments (documented through published or non published literature) in favour of pastoralism, and reaffirming pastoralists' rationality and the viability of their economic system. Thereby, I mean to underscore their contribution to improving their uncertain environment, their livestock production activities, their integration into markets through their role in marketing animal products.

Monographs on the pastoral systems of Sahelian countries

The main countries of the panel—Burkina Faso, Mali, Mauritania, Niger, Senegal and Chad—share the common fact of belonging to the Sahelian zone. Their principal system of animal production hinges on pastoralism, which is at the same time a way of life characterized by mobility and the use of natural resources. Within this vast zone dominated by climatic hazards, pastoralism is principally the activity of Fulani people, a multi-variety ethnic group disseminated throughout the Sahel. Though other ethnic groups (Touareg, Toubou, Wolof, Serere, etc.) have recently adopted pastoralism, the Fulani people remain its largest represented actors (Touré O. & Arpaillange J., 1986).

Some key concepts

Though they all refer to livestock systems or practices, terms like “pastoralism”, “nomadism”, “transhumance”, or “agro-pastoralism” remain confusingly unclear in their uses. Therefore, for a better understanding of the production and harnessing systems of natural resources, it is useful to briefly recall their meanings that prevail here.

Pastoralism refers to modes of herding on natural grazing lands, and therefore to systems where pastoralism is practiced extensively with less or no supplementation and without the use of any fodder crop. It involves herds composed of different species (bovine, ovine, goats, camelids, donkeys, equines), mono-specific or not. It is characterized by a peculiar mode of feeding based on the extensive use of natural grazing lands and requiring movements of varying amplitudes. It does not exclude the use of fodder crops to supplement the feed of the livestock. Mobility of the habitat, presence or absence of agricultural activities, and the pastoral system used, determine the different types of pastoralism.

Transhumance has to do with a repetitive, seasonal and to-and-fro practice of moving herds and humans following very specific routes. It has different modalities, and occurs within different types of pastoral livestock systems. It aims either at looking for range lands or water points necessary for feed or effective for improving productivity, or at marketing cattle and livestock by-products. Though less frequent, transhumance may also occur because of health concerns or may aim at seeking genetic reinforcement through salt cure and crossbreeding.

Nomadism describes the mode of life of pastoralists who, though very often rooted in an “attachment territory,” have no fixed and permanent habitat, and who move with all or part of their families on relatively long distances. The movements often take place with very large herds, and parts of the herd may belong to third parties. Because the movements have varying amplitudes, nomads tend not to practice agriculture; or if they do, it is only for the sake of subsistence.

In other words, when the movements are considerably reduced to allow pastoralists to undertake other activities (for instance trade or agriculture), the term sedentarisation applies and reflects a development in their practices and modes of life. If the development evolves towards agriculture without leading to an abandonment of pastoralism, the term agro-

pastoralism becomes appropriate to give account of the co-existence of agricultural and pastoral activities on different scales: a region, a village, a farm, etc. To each of these scales corresponds a level of integration of these activities, and generally with important consequences in terms of land tenure. Swift (1988, p. 1) has defined an agro-pastoral production system as one in which more than 50% of households' revenue come from agriculture, and 10 to 50% from pastoral livestock farming. Agro-pastoralism is also practiced by agricultural farmers who mean to diversify their activities through extensive livestock-raising (Bonfiglioli, 1990).

The global context of pastoralism in the Sahel

Many have tried to analyse the general situation of pastoralism in West Africa, and more particularly in Sahelian countries. For Antene (1984), McClintock (1984), as well as Metzel and Cook (1992), following the advancements achieved in the 1950s and 1960s, livestock production and animal export have stagnated, the use of intensification has been limited, and the productivity per grazing unit has been reduced. They have also noted a change in the social structures or institutional supports to pastoralism. More aware of the competition for land as well as that of imported products, pastoralists have moved to diversify their income and revitalize the management rules of their collective resources. In addition, important changes have been observed in the area of markets; the use of collective transportation means have become common practice, which has led to a drastic reduction of transaction costs. However, Sahelian pastoralists have been particularly made fragile by the last two great droughts (1973 and 1984), which have deeply modified their strategies for recomposing their stocks. And this has had more or less immediate effects on the level of their income, their cereal needs, and the amplitude of their movements during transhumance and emigration (Camilla Toulmin, 1986). The great droughts have equally affected their "de-stocking" strategies, because paradoxically, it is during periods of drought that pastoralists tend to sell off their animal at cheap prices to avoid high mortality rates, and especially to buy cereal. On the other hand, these tragedies have contributed to reinforce Sahelian pastoralists' capacities for adaptation.

Though these countries share some commonalities in terms of pastoralism (mobility and use of natural resources), a brief typology is helpful to better understand their economic situations and pastoral systems.

Table 1: Economic aggregates of Sahelian countries: economic, human development, and demographic indicators

	Burkina Faso	Mali	Mauritania	Niger	Senegal	Chad
Economic Indicators						
Growth forecast for 2006 ^a	5.0%	6.5%	27.0%	4.0%	5.0%	6.0%
Average growth 2000-2005 ^a	4.3%	5.8%	5.1%	3.2%	4.5%	10.9%
GDP 2004 (billion current \$) ^a	4.80	4.90	1.40	3.10	7.70	4.30
Average international aid 2000-04 (millions \$) ^a	464	458	249	352	556	223
Share of agriculture en 2003 (% GDP) ^a	31.0%	38.0%	20.0%	39.9%	17.6%	45.6%
Share of livestock (% agricultural GDP) ^c	24.7%	41.6%	70%	29.8%	37.3%	11%**
Human development indicators						
HDI (Human Development Indicator) ^b	0.317	0.333	0.477	0.281	0.458	0.341

HDI ranking (difference with GDP/capita ranking) ^b	175 (-20)	174 (-10)	152 (-13)	177 (-8)	157 (-10)	173 (-19)
---	-----------	-----------	-----------	----------	-----------	-----------

Demographic indicators

Population size in 2005 (thousand) ^a	12 822	13 124	2 980	13 499	11 386	9 448
Rural population (% of total population) ^c	82.0%	68.0%	38.0%	78.0%	50.0%	75.0%

Sources: a World Bank, « World Development Indicators » (2005) ; b UNDP “Global report on Human Development” (2005) , c FAOSTAT (2005)

** % of 2003 global GDP (Giraud, 2005)

Excepting Mauritania, all the other countries of the study panel belong to the West African Monetary Union and the West African Economic Community, share common management rules of a single currency (CFA F), and have a common External Common Tariff. Though their key macro-economic indicators are improving, the fact remains that they share the common fate of belonging to the poorly ranked category in terms of human development index. This ranking is unfortunately lower than the one derived from the GDP/capita criterion, which confirms their difficulties in terms of economic development.

Burkina Faso

Burkina Faso's pastoral system coexists with an improved, highly intensified and organized system in urban and peri-urban zones. Referred to as traditional extensive system, it comprises a Fulani transhumant system, one obtaining in developed pastoral zones, a sedentary one in villages, and an agro-pastoral one. Among these different systems, the transhumant Fulani one is the most important, as it involves 70% of the bovine population. Whether it is mono-species or not, the Fulani system has this peculiarity of relying on seasonal transhumance, which public authorities have sought to regulate at the national level through decrees, while their cross-border movements are regulated by ECOWAS laws requiring an International Transhumance Certificate (ITC) and observation of pastoral laws in receiving countries. To reduce or even eradicate the mobility of transhumant Fulani pastoralists, public authorities have fostered a pastoral zone development, which is expected to stimulate, through the provision of support services, a more rational and integrated livestock farming. Initially in 1997, there were ten (10) pastoral zones. However, this new orientation towards a more intensive system has not produced the expected outcomes in terms of productivity. Indeed, compared to the transhumant system, productivity has not improved significantly. Nonetheless, the authorities intend to create 40 others, because there is a demand coming from a growing semi-extensive dairy livestock farming system. On the other hand, the sedentary village and agro-pastoral livestock systems are practiced by ethnic groups other than Fulani, quite often for socio-cultural (dowry, naming ceremonies, etc.) and economic (complementary between agriculture and livestock farming) reasons. These systems tend to use external salaried staff (waged herders).

Box 1 : Burkina Faso—the global economic context

Burkina Faso is a landlocked country; its inhabitants are called Burkinbé—a gender-blind and neutral Fulani word referring to the people of Burkina Faso. The country has common borders with Mali in the North, Niger in the East, Benin in the South-East, Togo and Ghana in the South, and Côte-d'Ivoire in the South-West. A former French colony, it became independent in 1960 under the name of Upper Volta. Economically, Burkina Faso belongs to the group of least developed countries (LDCs). Its economic development faces the constraints of demographic growth and soil aridity. Agriculture is the main economic activity, representing 32% of GDP and involving about 80% of the active population. Livestock farming is important, but so is the farming of sorghum, millet, corn, peanut, rice, and cotton, especially in the South and South-West. Because the Burkinabé economy depends very much on cotton export, it is very sensitive to the depreciation of the terms of trade, and therefore to the lack of control of world market developments. Under-employment is chronic in Burkina Faso; and this is an important cause of emigration, especially towards Côte-d'Ivoire. Though this is relatively profitable for the country because of migrants' money transfers, it is also indicted when

conflicts break out in the receiving countries. Beside migrants' money transfers and export incomes, Burkina Faso also depends greatly on international aid (on average USD 464 millions per year). This said, it is noteworthy that the country can boast some mining productions: copper, iron and especially gold.

Mali

Pastoralism in Mali takes place especially in zones with a low level of land pressure and where climatic variations make agricultural activity very uncertain. The following categories of pastoralism obtain in Mali: pastoral livestock farming (nomadic and transhumant) and agro-pastoral livestock farming. Because pastoral livestock farming involves regular movements determined by resource availability, it is mainly concentrated in the North (the Sahara part of the country) and the Sahelian zone stretching over Gourma and Dogon countries. Milk, meat, and wool are the main pastoral products, and they are all almost entirely for self-consumption. Transhumant pastoralism is characterized by permanent to-and-fro movements between the Southern pastoral zones, where pastoralists go in search of grazing lands to harness until the rainy season, and the pastoral zones of the North, before returning to their regions of origin. The livestock population of transhumant farming is more important than the one involved in the nomadic system, but both are comparatively less productive. Cattle trade is very dynamic, with a potential for tradable surplus. Besides the pastoral system, there is an agro-pastoral one in which pastoralism and agricultural farming are generally complementary, because the two activities help to value each other's residues (crop residues used for animals and animal residue used as manure for agriculture). In this agro-pastoral system, animals generally serve as valuable patrimonial reserves or as savings instruments. Because food resources are available, movements, when necessary, take place within small amplitudes. The productivity of the livestock remains low, despite the various attempts to improve it.

Box 2: Mali—the global economic context

Mali has common borders with Mauritania and Algeria in the North, Niger in the East, Burkina Faso and Côte-d'Ivoire in the South, Guinea in the South-West, and Senegal in the West. 65% of the country is semi-arid or even arid. Mali's main economic sectors are agriculture and continental fishing, altogether involving 80% of the active population around the river Niger, and an industrial sector articulated around the agricultural activities. The country derives its financial resources from these economic activities; however, it highly depends on cotton export and is vulnerable to the fluctuation of world prices. Mali benefits from important international aid and receives money transfers from its numerous migrants in Europe and Africa. Following the devaluation of the CFA F in January 1994 and the economic reforms conducted by the Structural Adjustment Programs, Mali has enjoyed a 4% average growth. This is important but not enough to get the majority of Malians out of poverty. An economic diversification is underway, especially in the form of prospecting for gold between 1996-1998; making Malian authorities optimistic about the possibility of becoming an exporting country.

Mauritania

Because of agro-climatic conditions, agriculture is not a favourable economic sector. In addition, less than 1% of the land is arable. While agriculture employs about half the country's population, because it highly depends upon climatic hazards, it contributes for less than 6% to the GDP, and only rarely provides 30% of the country's food needs. Livestock farming is the most important activity of the primary sector, and is dominated by pastoral activity. It contributes 70% of the sector's GDP and about 14,6% of the country's GDP. The pastoral livestock system is a key link of the country's economy and has many variants: a nomadic pastoral system, a pastoral and transhumant agro-pastoral system, and a sedentary agro-pastoral system. Highly constrained by the drought, the nomadic pastoral system essentially comprises camelid and goat herds, which are constantly on the move, sometimes over long distances depending on the availability of resources. Given the characteristics of camels, herders often travel about 30km, from water points to grazing lands. The weak animals receive food supplements made of wheat and peanut cake. Besides serving as a means of transportation, camels are also used as food on important ceremonies, for the production of milk much cherished by urbanites, and for the production of items used for building tents. As to goats, they are usually used for food or sold to help procure common goods. The pastoral and transhumant agro-pastoral systems essentially involve bovines, ovines, and sometimes goats and camelids. Salaried herders, generally accompanied by a family member, are

responsible for keeping the animals. For long, the movements took place over a relatively long period of time (7 to 8 months), often across borders. However, movements are gradually diminishing and tend to be limited to the lean period (May to July) and confined to the South of the country, where more water and grazing land obtain. The farming of goats remains a secondary activity and is essentially practiced in the South-East, with punctual incursions into neighboring Mali. Urbanites tend to raise camelids, thereby seeking to tap the commercial potential of the activity. This explains why large populations of milk-producing female camels live around big cities such as Nouakchott. A ritual practice of milk cure during takes place in those cities during the rainy season. Outside this season, urban camel owners do not draw any benefit from their livestock. The herders, usually Fulani people, take the animals further away and use them for their own food and for consolidating their social networks, which the development of urban camel ownership tends to jeopardize. Ovine milk production serves to feed the lambs, while the rams are sold in Mali and Senegal. The trade of rams hikes in the periods of religious ceremonies (Aid El Kêbir celebration). The sedentary agro-pastoral system generally involves bovine and small ruminant herds, for which crop residue is quality feed. Bovine raising is essentially located in the South of the country, while the South-East tends to specialize in small ruminants and punctually resorts to fattening operations for young lambs. During the rainy season, herders move their animals at night to prevent them from damaging crop farms, and during the day, they let them roam around. Their milk production is used for household consumption, and not sold, because the quantities collected are generally small. Rams are often sold during festival periods; the money thus earned serves to meet families' basic needs. However, it has been observed that because of the desertification, certain pastoral populations tend to settle around urban centres. And this has led to a reduction of their means of production, and gradually transformed them into proletarians (Abdel Wedoud Ould Cheikh, 1985).

Box 3 : Mauritania—Global economic context

Mauritania is located in North-West of the African continent and boasts a long coast on the Atlantic Ocean, between Algeria and the Western Sahara in the North, and it shares borders with Mali in the East and Senegal in the South. It has a heterogeneous population dominated by the Moor group. Its economy rests on the following five pillars: livestock essentially composed of dromedaries used for meat and oxen (this livestock farming is a secular nomadic practice, and its product tends to serves for local consumption—less than 2% of the total export); flood recession agriculture, which is very dependent upon climatic conditions, in oases, and rainy fed agriculture in the backcountry; rudimentary and intensive fishing, which enjoys an exceptionally fish abundant littoral; and iron mining, which is a source of important income for the country (up to about 95%); and oil resources whose exploitation is only recent (2006) and represents a great potential for income. Livestock farming (the second source of export) represents 35% of the agricultural GDP and 13% of the global GDP. It may play a key role in the economic development of the country and for the socio-economic development of the populations, especially for vulnerable households in rural areas.

Niger

Facing strong environmental uncertainties which tend to limit its performance, Niger's pastoral livestock farming system depends on extensive grazing. Small ruminants and, gradually, camelids, are being favoured because of their intrinsic characteristics. Small ruminants are appreciated for their high reconstitution rate, especially following important exogenous shocks (droughts), and camelids for their great capacity for adaptation in the Sahel of the North. Bovine and ovine herds tend to move towards the South-East of the country, in the agro-pastoral zone which has largely encroached on the pastoral zone.

Transhumant pastoral livestock remains dominated by Touareg and Fulani people. The Fulani are found almost everywhere throughout the Sahel, but are never a majority anywhere. They mostly operate in the South-West and South-East of Niger, but recently, they have been making incursions into the pastoral zone of the North. Their main strategies boil down to scattering around the disparate water points during the dry season, and regrouping around ponds and grazing lands as soon as the rainy season starts. These movements tend to converge, though their amplitudes remain under 150km. Another operational strategy used by Fulani pastoralists during lean periods consists in dividing up their livestock to achieve better

survival rates. Small ruminants are preferred for consumption, while the big cattle constitute value reserves and a means of social prestige.

Box 4 : Niger—the global economic context

Niger is a West African country surrounded by Algeria, Benin, Burkina Faso, Chad, Libya, Mali and Nigeria. Its capital city is Niamey. Its economy rests mainly on agriculture, which represents 40% of the GDP and involves 90% of the active population. Niger has an agro-pastoral zone in the South of the country, a relatively humid region allowing for cereal crop production (millet principally), and an exclusively pastoral zone in the North. Irrigated agriculture is very limited (less than 2% of the cultivated area), which makes agricultural production very uncertain. In July 2005 the United Nations declared a food crisis in Niger: drought combined with cricket invasion in 2004 to make cereal production decrease by 11% annually, and to create a fodder deficit of about 35% of the needs. Niger has important natural and mining resources, especially enormous uranium reserves in Arlit region yielding about 72% of export revenue. Though an oil producer, Niger fails to distribute the oil income equitably, and in March 2005, this led to important popular demonstrations.

Demographically, Touaregs are as representative as the Fulani, and they are found in the pastoral zone where they are dominant and operate according to a feudal mode with a caste social division system. Though some of them are gradually adding agriculture to their activities, most Touaregs remain pastoralists and live in a scarcely populated area quite unfavourable for agriculture, in the north of the agro-pastoral zone. While some of them continue to practice transhumance, some others among them are becoming sedentary populations. Further to the East, the Touareg population lives in a vast region stretching from the agricultural zone deep into the desert. They move in a dispersed manner during the dry season and converge towards the region of Tegidda when the rains start falling. Their movements differ from those of the Fulani, reaching about 1000 km of amplitude. However, gradually only a few Touaregs are moving with their herders leaving the rest of their family members in their camps. Sedentary Touaregs own huge ovine and camelid herds. Those living around Niamey and Dosso manage to survive through agro-pastoral economy, which has become necessary because of the growing constraints inherent in mobility.

Senegal

With more than one third of its territory being under a Sahelian type of climate, Senegal has an important pastoral and agro-pastoral livestock system, especially in the North—the peanut growing basin—, in the silvo-pastoral zone (SPZ), and in the South of the country. Much of the pastoral livestock farming takes place in the SPZ, a 67610 Sq/km wide area located between the regions of Saint-Louis, Louga, and Matam. The area presents a wide ecosystem, geographic, pastoral, biological and socio-economic diversity. South of it, agricultural farming is growing vigorously, thereby contributing to the development of an agro-pastoral system. North of the SPZ, the nearness of the river Senegal and the main highway influence a gradual diversification of pastoralists' activities. Pastoral know-how remains widespread, though pastoralists periodically exercise other activities involving the transfer of manpower toward agriculture or trade. Only in the centre of the SPZ is there an exclusively pastoral activity; however, during the rainy season, subsistence agriculture is also practiced. Though the Fulani remain the majority of livestock farmers, other ethnic groups (Moors, Sereres, and Wolofs) are also present in the zone and tend to combine livestock raising and other activities such as agriculture and trade. The presence of Wolofs dates back to the Djoloff kingdom era, though recently some Wolof people have come in from the peanut growing basin seeking to diversify both their agricultural production zones and their economic activities. Their migration toward the Ferlo region may also be accounted for by the decrease of their peanut productivity. As to the Moors, they took advantage of their old trade links with the Djoloff populations to settle in the area.

Box 5 : Senegal—the global economic context

Senegal, the most Westward country of the continent lies along the Atlantic Ocean, and has Mauritania in the North and East, Mali in the East, and Guinea and Guinea Bissau in the South. A quasi-enclave of 300km, the Gambia separates the Casamance region from the rest of Senegal. The climate of Senegal is tropical and dry, and comprises two seasons: a dry one and a rainy one. Ranked as the third economy of the sub-region after Nigeria and Côte-

d'Ivoire, Senegal looks principally towards Europe and more and more towards Asia (especially India and China). Compared to the other WAEMU countries, Senegal can boast very little natural resources. It draws much of its revenue from tourism and fishing, as it has a long littoral. However, because of its geographical location and its political stability, Senegal is one of the most industrialized African countries, hosting many multinationals, mostly French and a few American. The agricultural sector employs about 70% of the active population, and faces strong climatic hazards and cricket invasions. Like most other African countries, Senegal receives international aid, and the transfers of its migrants have considerably been increasing.

The herds are often mixed, comprising small ruminants and bovines. Because of their capacity for adaptation and their fertility, small ruminants are dominant. This is also so because they perform another socio-economic function, which is more operational in terms of providing basic foodstuff and of leading to bovine farming—reputed as more prestigious.

Chad

Pastoral livestock farming represents an important part of Chad's economy, and it has found a favourable ground in the Sahelian zone where a cyclic drought tends to deeply disturb plants and animals. With the demographic increase, animal protein plays a fundamental role in the population's nutrition; and it therefore requires qualitative and quantitative improvement. Until recently, ovine and goat farming was considered as priority, but actually only bovine raising had received more attention from researchers and public authorities. Chad comprises four climatic zones, from South to North: a desert climate with less than 50mm rainfall per year; a sub-desert climate between 50 and 350mm rainfall isohyets; a Sahelian climate with 350 to 500mm rainfall; and a Sudanian climate with 800 to 1 100 mm rainfall isohyets. The reduction of humidity as we move northward determines the shift from a sedentary mode of life to pastoral nomadism. Pastoralism involves an unequally distributed population and is practiced by different groups of pastoralists, depending on climatic and ecological conditions. Pastoralists' economic life in Chad depends almost entirely on livestock products and especially on the meat of small ruminants. The main vocation of livestock in Chad is to produce meat, generally consumed by the rural populations themselves (Bonfiglioli, 1992).

Box 6 : Chad—the global economic context

Chad is a completely land-locked central African country. It shares borders with Libya in the North, Niger and Nigeria in the East, Cameroon and the Central African Republic in the South, and Sudan in the West. Its economy is dominated by agriculture and cattle raising, the two occupying the majority of the active population. The main export products are cotton, cattle, and Arabic gum. Since 2004 it has become an oil-producing country, with the oil fields located in the Oriental Logone area. As part of the new monetary and financial flux, Chad elaborated and signed an agreement protocol with the Bretton Woods Institutions and the companies exploiting the oil. The protocol provided that 10% of the oil revenue would be set apart in a special account for "the future generations," the remaining 90% were to be used for priority expenditures. The protocol has for some time now been the subject of controversy, which has led to a confrontation between the authorities of Chad and the international institutions. This has further weakened the State, which faces periodic guerrilla outbursts and latent conflicts with its Sudanese and Libyan neighbours.

The case for pastoralism

Pastoral activity is characterized by different factors: a massive use of natural resources, a low use of intensification inputs (veterinary treatment, food supplementation), a partial and punctual immunization coverage--especially since the privatization of veterinary services and the end of global immunization campaigns--, and particularly adoption of mobility as a key strategy for fostering ecological complementarities between Sahelian pastoral zones and Sudanian regions, thus contributing to reduce pressure on seasonal grazing lands and to improve the management of risks and hazards.

To argument for pastoralism requires first solving once and for all the somewhat surprising issue of pastoralists' rationality, before going on to discuss the economic viability of this mode of life and production.

What is pastoralists' rationality?

Treating pastoralists' rationality means wondering about the fundamental decisions they make, in order to see whether they develop maximizing behaviours (whereby they conform to classic economic theories), or whether they have differentiated behaviours. Many field workers have questioned this manner of positing the existence or not of a rational attitude among pastoralists. Doutresoulle and Traoré (1947) underscored the productivity of pastoralists' activity in an uncertain environment; while Gastelly (1980) and Gabas (2003) raise the issue of both rationality and the market as an optimum place of coordination.

The second option matches more with what has been observed among pastoralists in the Ferlo zone, Senegal (Wane, 2005), where it has been proven that pastoralists use adaptive strategies and a form of rationality peculiar to their social context, and which they contribute to promote. This differentiated attitude also translates otherwise through maximizing and non maximizing behaviours, leading them to use markets in a limited and punctual manner, depending on their consumption, investment and speculation motivations.

Also, the issue of pastoralists' rationality or lack of it is often heard in the discourses of observers external to the pastoral world and whose thinking obeys the need for modernizing livestock farming (intensification). They tend to rest their cases on clichés rather than on a refined knowledge of the economic, agro-ecological and social realities of pastoralism (Ancey and Mona, 2005). Indeed, these "modernist" approaches mostly tend to segment the livestock sector and assign specific tasks to the different zones: to dry areas, they give a function of birthing pastoralism; to the more humid zone, a fattening function; and to zones endowed with grazing lands and in connection with market places, a function of "finishing" the animals meant for slaughterhouses.

The contribution of pastoralism to the improvement of an uncertain environment

To be sustainable, the transformation process of pastoralism must agree with ecological and social stakes as well as economic imperatives. Pertinent development options should favour production systems that are more apt to meet all of these challenges. Though now widely acknowledged, not all actors recognize the efficiency of pastoral systems in terms of improving the dry and semi-arid zones; and their capacity to meet the three challenges has not been enough proven scientifically. The major stake is therefore to demonstrate that extensive pastoral systems, which are simple in their principles but complex in their implementation (because they take place in difficult areas), preserve fragile environments while securing rural societies.

For long and through concepts such as "overgrazing," "desertification," and "soil degradation," pastoralism has been stigmatized as an environmental degrading factor. However, it is now enjoying a state of grace through recognition of its contribution to the improvement of its environment. By re-qualifying pastoralists' environment in dry lands as an uncertain, variable, unbalanced ecosystem, etc., the major contributions of such researchers as Ellis and Swift (1988), Westoby et al. (1989), Behnke, Scoones and Kerven, ed. (1993), Scoones (1999), Ellis (1999) and Perrier (1999), have helped to re-think the ecology of grazing lands, and to seek to determine the respective shares of climatic factors and pastoral activity in the process of degradation of the pastoral environment. Considering that in African dry and sub-arid lands the environment is in a state of permanent imbalance, both the climate and the predatory effect of herbivores on plants and water resources are variables of the system. Through this approach, the above researchers have proposed an explanation of the repetitive failures of the pastoral projects that have focused on the search of "balance" solutions based on the idea of "load capacity." Their contributions have helped to rehabilitate pastoralism, by maintaining that it is not a significant influential factor of the sustainable degradation of this type of environment. On the contrary, it seems that the mobility strategies that pastoralists implement may even counter environmental risks.

The contribution of pastoralism to the production of animals

The production of animals in pastoral zones has become specialized, and this has helped raise collective awareness about its crucial importance on the meat market, and about the existence of organized sectors. The current statistics on the productions of the pastoral sub-sector mainly come from FAO, and are used at national levels by institutions and

organizations operating nationally. National statistics on pastoralism do exist, but their levels of precisions vary considerably.

Table 1: Sahel—land uses

	B. Faso	Mali	Mauritania	Niger	Senegal	Chad
Land uses (2003)						
Total area (Sq./ km)	274 000	1 240 190	1 025 520	1 267 000	196 720	1 284 000
Agricultural area (% of total area)	40%	28%	39%	40%	42%	39%
Permanent prairies and grazing lands (% of total area)	22%	24%	38%	19%	29%	35%

Source: FAOSTAT, 2005

Generally speaking, Sahelian countries are characterized by relatively similar surface areas reserved for agriculture (between 39 and 42%), except in Mali where the level is below 30%. Within these agricultural pockets, the areas set aside as permanent grazing lands and prairies vary from one country to another. In proportion to their geographic surface areas, Chad and Mauritania have larger grazing lands than Niger, where despite the size of the country, the areas of grazing lands are relatively limited because of the expanse of the desert.

From the point of view of livestock populations, Burkina Faso has less surface area, which however covers a more humid zone and contains a large animal population (more than 23 million heads), just behind Mali, a much larger country. In other words, the average animal density is 984 animals/km² (of grazing land) in Burkina Faso, while this is 10 times less in Chad and Mauritania.

Table 2: Sahel—Average estimates of livestock size and animal density (2000-05 average)

	B. Faso	Mali	Mauritania	Niger	Senegal	Chad
Livestock						
Bovines	7 168 346	7 119 550	1 574 739	2 252 750	3 037 460	6 196 645
Ovines	6 632 908	7 501 400	8 617 603	4 481 983	4 650 766	2 494 424
Goats	9 889 273	10 950 083	5 459 584	6 870 667	3 972 138	5 515 535
Camelids	14 728	470	1 285 333	417	1 613	729
Animal density per km² of grazing lands	987	302	112	142	482	82

Source: FAOSTAT, 2005

Except in Mauritania and Senegal, small ruminants, especially goats, are dominant among the livestock populations. In Mauritania camelids hold an important place in pastoralism, while they are marginal in the other countries. The strong social connotation of dromedaries in Mauritania and their capacity for adaptation in dry areas may account for this: in addition to

providing meat and milk, they are also widely used for the transportation of goods and persons in the desert.

Though pastoralists still favour cattle as a means of subsistence, it is noteworthy that there is a growing diversification of their revenue sources, both inside and outside pastoral activities. Indeed, more and more pastoral populations tend to orient some of their members toward activities outside pastoralism by transferring manpower into other economic sectors: agriculture, trade, rural exodus, emigration, etc. (Metzel and Cook, 1992). Inside pastoral activity, this diversification is notable in terms of a growing commodification of livestock by-products (meat, butter, milk, etc.) and of gathering products (Arabic gum, pain de singe, etc.), an essentially women activity (Diao, 2001). The following analyses are based on FAO statistics.

Diary production among pastoralists in Senegal is largely constrained by the cycle of the seasons: in winter the sector experiences over-production and under-marketing because of the high level of transaction costs and the weakness of collection, stocking and marketing infrastructures. On this ground the NESTLE company became interested in the sector, but its experience was inconclusive due to various causes (difficulty of collecting the product, quality problems, high transaction costs, etc.). Though there is no particular tension on the milk supply, especially during the rainy season, Senegal remains a milk importer country; so much so that even in the silvo-pastoral zone, Fulani pastoralists also consume imported milk (powder).

Table 3: Sahel—Average milk and meat productions

	B. Faso	Mali	Mauritania	Niger	Senegal	Chad
2000-05 average milk production (Mt)	195 734	559 668	339 918	313 850	127 905	231 596
Cow, unskimmed, fresh milk	82%	31%	35%	58%	75%	72%
Sheep milk	0	20%	27%	5%	12%	4%
Goat milk	18%	39%	31%	33%	13%	14%
Camel milk	0	10%	6%	3%	0	9%
2000-05 average meat production (Mt)	198 270	232 843	86 795	132 146	166 152	121 096
Beef and veal	48%	41%	26%	29%	28%	64%
Sheep and lamb	8%	14%	27%	11%	9%	11%
Goat meat	13%	19%	15%	19%	10%	17%
Others	32%	27%	31%	41%	53%	8%

Source: FAOSTAT, 2006

A similar situation prevails in the meat market characterized by a conflict of interest between final consumers and pastoral producers. While the first are interested in finished pastoral products (milk, meat, etc.), Fulani pastoralists remain on their position in the primary sub-sector (pastoralism), that is, without any processing (selling of live animals). In addition, because of the information asymmetry characterizing cattle markets and pastoralists' strategies of adaptation (Wane, 2005), the mechanic "de-stocking" expected by State authorities does not occur, which leads to the import of milk to meet the potential and constantly increasing demand. Thus, as Metzel and Cook (1992) noted, pastoral products find themselves competing directly with imported products that are highly competitive, as they are massively subsidized by their countries of origin.

Yet, there is one problem. FAO statistics on livestock populations in West Africa do not result from a comprehensive census. The figures are often biased because they use a 3% growth

rate for ovines and goats, and are therefore either under-estimated or over-estimated. In addition, they are highly globalizing and not enough refined to determine the actual contribution of pastoralists compared to agro-pastoralists and the intensive systems. Punctual attempts have been made in the various countries of West Africa.

In Senegal, the French Cooperation (Deramon, de Gonneville, Pouillon, 1984) undertook a quantitative analysis development study focusing on bovine pastoralism. The study used the Sodesp mechanism, which has played a key role in the development of pastoral hydraulics. It meant to do a macro-economic analysis of the bovine sector in Senegal: on the one hand, one component sought to estimate pastoral livestock, despite the technical difficulty of implementing such an approach, and on the other hand, a second component did an economic evaluation of the contribution of bovine livestock to the national wealth produced in 1981-1982. The authors of the study reached the conclusion that the pastoral bovine sector represented about 1 156 000 heads, 44% of the national population, and contributed about 50% to the added value of the pastoral sector and 2.5% to the country's GDP. They also observed that the pastoral bovine sector integrated poorly into the rest of the national economy, as its direct added value only represented 4% of the global added value.

Another study conducted by Sutter (1987) among the North-Eastern Fulani of Senegal sought to verify the relationships between the size of household herds and several critical variables related to pastoral productions. They noted significant differences in terms of wealth between pastoral households and the deep impact of those differences on certain pastoral parameters such as the contribution of pastoralism to subsistence consumption, the income and expenditure structure of pastoral households, the composition of the herds sold in terms of the age and sex of the animals and the take away rates. The study also highlighted the fact that several among the unequal processes are self-reinforcing and must be perceived from the perspective of the major changes that occurred during the past 30 years, especially the increased orientation of pastoral economy toward marketing and the permanent movements of herds toward State drilled boreholes.

In Burkina Faso, a vast survey was conducted in 1989 as part of ENEC (National Evaluation Survey of the Livestock). The study found that the current statistics dating back to 1987-1988 were under-estimated by 30 to 45%. The ENEC findings were also contested by Tyc (1992) who questioned the figures on the bovine livestock and by Holtzman and Kulibaba (1992) who insisted that the number of animals in the countries within the central corridor is volatile because of the migration fluxes between Burkina Faso, Mali, and Côte-d'Ivoire. Concerning animal production and the structure of herds, Meyer (1989), Tyc (1995), Guissard (1992), Dicko, Hamidou and Darga (1994), and Gningue (1995) conducted surveys which showed: a) a form of diversification favouring a shift from an almost exclusively bovine livestock farming to a mixed system; b) the promotion of gradually large herds to cope with the various risks; c) a desire for capitalization, because the animals are not meant for systematic marketing, they also fulfil other socio-economic functions (patrimony, prestige, etc.); d) a significant modification of the structure of herds depending of the size of the livestock and the cyclic variations of the climatic, economic, social environment, etc.

In Chad, two studies were conducted in 1975-76 by SEDES and in 1977 by BIRD-IEMVT on the zoo-technical and economic parameters of ovines and goats. As a result of the war and the long period of drought which hit the country, the department in charge of pastoralism decided in 1983 to update the findings of these studies. The BIRD-IEMVT study was complemented by another on the per capita annual productivity divided by the average weight per farm. The conclusions reached were that Mavo-Kebbi ovines and goats in the South were more productive, closely followed by Fulani ovines and Kirdi ovines. The Arabic sheep was the least productive because of the harshness of the climate of its environment. With respect to growth, the Fulani Oudah ovine species proved the most precocious and the heaviest. This performance reveals Fulani pastoralists' technical level and capacity for adaptation. In the South, the Mavo-Kebbi sheep confirmed that it was the most rustic compared to the other sheep in the same region. Concerning goats, the growth curve proved stagnant, thus revealing that the growth of the young ones was constrained by the take away rate among goats. Productivity is high among goats and ovines in the South, lower among the ovines and goats of the North, and increases in proportion to the age of the animals.

The contribution of pastoralism to the marketing of animal products

An examination of the livestock sector of the Sahelian zone of West Africa quickly reveals an important distance between production zones, essentially located in the sub-arid areas, and consumption zones, the big urban centers, especially of the coastal zone. Following a historic, anthropological and economic study of West Africa's Sahelian meat markets, Van Ufford (1999, pp. 35-65) asserts that a formal or non formal trade network is useful to help them adapt to such a sector characterized by relatively important distances between production zones and consumption ones. The efficiency of such a network would depend on the market actors' capacity to build solid links between themselves; the most important of such links should be based on capital base. In other words, in this kind of markets founded on globally informal relations, belonging to an identified network represents a solid basis for contractual relationships; trust and reputation are federating values. Another fundamental criterion has to do with the importance of identity markers, a) in structuring those markets, b) in differentiating sellers and non-sellers, as well as the members of the community of sellers themselves, and c) in maintaining an efficient trade network.

The cattle markets of the Sahelian zone present numerous similarities in terms of their organization. Many types of economic actors operate in those markets, but only four play major roles. The State is one, as it provides the necessary space, the geographic location for exchanges and some other annex services (water, slaughterhouses, immunization, etc.). In return, the State collects lump taxes on each animal sold.

There are also the rich traders, who significantly influence sales conditions. Often they buy wholesale, and resell in big urban centres. They are the main market price-makers.

Then there are the intermediaries (called tefanke in Senegal, damin in Chad, etc.). Every actor in the market knows them, and they play a key role of intermediation between traders and pastoralists, with whom they have kinship relations. They contribute to make the exchanges fluid. Their presence on the markets may be accounted for by the mobility of pastoralists, who otherwise would find it difficult to prove their ownership of the animals they sell. To overcome this potential difficulty which may hamper exchanges, the intermediaries take the responsibility for the ownership by using their knowledge of the wheels of the markets and of the actors therein operating. In so doing they provide sales and after-sales security guarantees. Often, they go directly to the bush markets where they purchase the animals and have pastoralists take them to their places.

And finally, there are the pastoralists. They supply the markets with their animals and return home with the money they earn, minus the different taxes and intermediation commissions. Their key counterparts on the markets are the intermediaries who serve as guarantees for their ownership of the animal sold, vis-à-vis the other economic actors in the process of exchange. Besides production hazards, they also often face risks related to the transportation of the cattle to the rallying markets (accidents, thefts, etc.). It is noteworthy that not the entire production of pastoralists is offered on the markets. Most often, they determine in advance a target level of revenue depending on their current consumption needs, and go to the markets to look for the amount needed.

Exchange modalities on Sahelian cattle markets also present numerous similarities. A typical exchange begins with negotiations between pastoralists, as owners of the animals to be sold, and the intermediaries, as unavoidable market actors. Two situations may arise. In the first, we may have direct sale through intermediation. This is the most common situation on cattle markets. Here the pastoralist does not waive his ownership rights. He resorts to the services of an intermediary who does not bear the market risks but instead stands as a guarantee for the pastoralist-seller. The pastoralist states his price for the animal and negotiates with the intermediary to reach an intermediation balance price that is agreeable to him, with a clear understanding that in case of success, the intermediary will deduct a lump commission from the price (in Senegal this is 1000 CFA F per bovine and 200-250 CFA F per small ruminant). The intermediary then proposes the animals to the traders, possibly adding an extra margin representing a sales added-value, which adds up to his intermediation commission. The second situation that may arise is direct sale to the intermediary who buys the animal from the pastoralist and re-sells it with an added-value. In this way, the market risks and pastoralists' ownership guarantees are fully transferred to the intermediary. This approach may be a favourable anticipation indicator of market conditions.

One other common feature of Sahelian countries has to do with their status as milk producers and importers. This simply means that there is a potential demand that is insufficiently met, though as Ancey and Monas (2005) have noted, the level of demand to be satisfied is not exactly known.

Table 4: Sahel – livestock product import and export

	B. Faso	Mali	Mauritania	Niger	Senegal	Chad
Milk (2000-05 average, Mt)						
Production	195 734	559 668	339 918	313 850	127 905	231 596
Import	23 281	49 475	68 100	38 728	152 159	6 476
Export	1 364	0	91	838	12 466	0
Estimated potential demand*	217 651	609 143	407 927	351 740	267 598	238 072
Meat (2000-05 average, Mt)						
Production	198 270	232 843	86 795	132 146	166 152	121 096

Source: FAOSTAT, 2006, and my own calculations

* Estimated potential demand: production + import - export

Milk and meat productions are the major objectives of pastoralism in Sahelian countries. Besides self-consumption production, pastoralists have surpluses that they sell. The only problem is that Sahelian countries remain exposed to two key constraints: high transaction costs and cutthroat competition coming from imported goods.

The upward trend of import in Sahelian countries is due to the existence of sub-optimal world markets (unfair prices) resulting from persisting numerous distortions (subsidies to producers, perishable products making prices dependant upon stocks, markets dominated by big producers-sellers, surplus markets, etc.). Thus for instance, the milk and meat imported by Sahelian countries turn out to be more competitive than the local productions.

Begun way before the independence of those countries, the sale of surplus productions from Western and Latin-American countries in Sahelian countries is still on-going, and deeply affects local productions. Milk import began in the 1950s, but it is only in the 1970s that meat started to be imported.

The production of milk has always been a major objective, and this has affected the marketing of animals, with a particular tendency on the part of pastoralists to sell male animals.

In Mali, Von Massow (1989) and Debrah et al. (1988) have produced monographs on the milk market. They observed a relatively high rate of self-consumption (between 60 and 90%), increasing in proportion to the distance from the capital. They also noted that the flat-rate floor price set by the competent State company (SOMIEX) fluctuated according to the season. Only SOMIEX could import milk. It possessed an exclusive licence, and its mission was to offer imported milk at the same price all over the country. As a result, the imported milk consumed in rural areas was implicitly subsidized since import costs did not reckon with delivery prices in Bamako. Von Massow (1989) also looked at the elasticity of the demand for imported dairy products compared to the revenue (+0.44) and price (+0.97). Apparently, the consumption of imported dairy products is very sensitive to price variations and to a lesser degree to revenue variations. However, these figures are strongly influenced by the price of condensed and evaporated milk and must be relativized, as Von Massow (1989) himself recommended because of the near total lack of consumption statistics.

A similar situation prevails in Burkina Faso, where imported dairy products happen to be more competitive than local ones.

The Club du Sahel (1990) has produced a global study on the West African meat markets showing that a) pastoralists evidence a growing interest in marketing their animals in coastal urban centres where they can find important markets, due to a concentration of purchase powers and the difficulty, for health reasons, to undertake viable livestock farming there; b) pastoralists seek to buy cereal supplies in those centres; c) the actual demand for meat has weakened since the 1970s; d) the competition of imported meat from Europe and Argentina (from 15% of the West African market in 1970 to 61% in 1987) has deepened; and as an immediate effect of this, local exchanges have been de-structured and intra-zone export potential has dwindled by 30%.

In Senegal, Ly (1990) had already noted that the average meat price was relatively stable, though important increases were observed in 1982-83 following the Structural Adjustment Programs which caused internal cost prices to rise. In addition, Ly noted that the import of meat was cyclical and that in 1988 it decreased because of high tax pressure. But this has not had significant effect on the local supply, which has remained rigid.

Overall, the main pastoral products of Sahelian countries (milk and meat) face two major constraints: price instability and supply instability. To increase the marketing efficacy of pastoral products, it is not enough to focus on support and supply control strategies. It would be more judicious to develop strategies to reinforce the competitiveness of pastoral products, targeting the needs of the sector and especially respecting the intrinsic characteristics of the activity. This could for instance take the shape of helping to make the environment safer and to improve the infrastructure and marketing norms.

The contribution of pastoralism in terms of output per hectare

Considering that the vocation of pastoralism is to produce meat and milk to be sold on national markets, it seems more instructive to compare the productivity of pastoral activity with that of other intensive systems having a stronger marketing vocation, using the annual volume of protein per hectare as a basis for the comparison. The point is to study the yield per hectare through comparing the traditional pastoral system with, say, the commercial ranching system. Several avenues have been considered in comparative studies conducted on different fields: one by Breman and de Wit (1983) in the Sahel of West Africa, one by Western (1982) in Eastern Africa, and another one by Scoones (1994) in Southern Africa. These different studies converge all to the idea that compared to the ranching systems of Australia and Canada, the traditional pastoral one has a higher yield per hectare. In West Africa, the Breman--de Wit (1983) and Wilson et al. (1983) study shows that in Mali, transhumant pastoralists' annual production of animal protein per hectare was double that of sedentary agro-pastoralists in the United States and Australia.

Many analyses tend to confirm the economic performance of pastoralism in the Sahelian zone. Now to improve this system of production and marketing as well as its sector as a whole, there is a need to improve its capacity to meet various challenges.

The challenges of the economy of pastoralism

This part aims to describe the challenges facing the pastoral economy of Sahelian countries and to propose research avenues to economists interested in engaging in an efficient reflection/action for the development of pastoralism. First, the approach used is prospective and offers indicators on the inflexion of the economic research for development. Second, it underscores the interest and usefulness in envisaging high density qualitative studies aiming to simplify decision-making. Then, it contributes to the structuring of a network dedicated to pastoralism, by providing a list of resource persons. Finally, it draws a list of the major bibliographical studies that recognize the pertinence of pastoral economic practices in the Sahelian zones.

The challenges facing pastoral development

Along the arguments in favour of pastoralism and its inclusion in the sub-sectors to target by public policies, there is the issue of the new orientations for its development. Given the current difficulties that pastoral economy experiences in satisfying the increasing potential demand for meat (31% in the 1980s and 60% in 2020) and milk (25% in the 1980s and 52% in 2020) in developing countries (Delgado et al.1999), the development of pastoralism should

first meet two types of challenges: economic ones, and socio-political and environmental ones.

The economic challenges to be met by pastoralism

These economic challenges rest on a number of pillars:

1. A wider dissemination of the arguments in favour of pastoralism as a form of economic improvement

One aspect of the weakness of the economic literature on pastoralism in the Sahel has to do with the discretion of research in terms of determining the actual weight of pastoralism in the agricultural GDP and the production of national wealth. There is a strong feeling that the pastoral sector contributes much to national economies, yet only very few scientific productions focus on a global approach to it; and the existing ones are relatively old. The new orientation requires among other things an updating of the studies on the economic viability of pastoralism in Sahelian countries. This would have the benefit of quantifying the economic arguments in order to stimulate, simulate and facilitate the making of decisions oriented towards the economic development of pastoralism. It would, for instance, require the State to determine the global cost it would have to bear in supporting pastoral economy, compared to the economic, social and environmental advantages to be drawn.

In Senegal, URP Pastoralisme-PPZS has largely evidenced this ambition through reinforcing its social science team. It has recruited an economist whose mission is to evaluate the Ferlo pastoral economic system and to elaborate a statistics backed line of arguments on the performance of pastoral economy.

Choosing to limit ourselves to the economic and systemic aspects of the performance of pastoral activity requires us to focus on two main analytical tools. The first tool draws on the notion of efficacy, whose immediate effect is to determine the outcomes of the activity. Indeed, by reasoning exclusively in terms of outputs, one can avoid being concentrating on the processes, actions and resources of pastoral organization and instead focus on the actual productions, clearly separating the tangible ones (goods) and intangible ones (services). The outcomes to be expected from this research direction are by nature quantitative, and these are: analysis of performances through the notion of efficacy, and determining the aggregate pastoral productions, plus incidentally, the aggregate global income.

The second research direction goes deeper into economic analysis because it focuses on the notion of efficiency. This means that the outcomes reached earlier are to be compared with their production cost. Here we consider all pastoral production items in terms of the processes, actions, and resources of the organization of pastoral populations. Our efforts here will go into determining all the costs generated by pastoral activity—direct and indirect as well as variable and fixed production costs—, and investment costs (Duraiappah and Perkins, 1999). All externalities should be taken into consideration (use of economic evaluations applied to goods and environmental services (Little, 1999; Hearne R., 1996; O'Connor and Turnham, 1992). The expected outcomes for this analysis would be to appreciate two types of economic contribution from pastoralism: the one outside taking into externalities into consideration, and the other within taking them into consideration.

2. Improving the performance of pastoral economy

A diagnosis of the potential losses of performance as well as of risk and vulnerability factors is necessary to facilitate the study of the optimization strategies of pastoral production processes and of the possibilities for covering the risks. Ultimately, it will be appropriate to identify reflection avenues necessary to determine the extent to which it is possible to improve pastoral performances as part of a sustainable development strategy, taking into consideration the global environment of pastoral activity (ecology, policies, social and cultural). Improvement of the performance of pastoral activity would not be understood just in terms of gain in productivity, because pastoralism outside intensification already seems to produce relatively high results. On the other hand, it would be interesting to make some progress in terms of reducing losses and wastes during the production and marketing process.

3. Reinforcing the security of pastoralism

The approach adopted must be systemic because it involves a study of the durability of pastoral activity. In other words, the point is to shed light on the capacity of pastoral activity to adapt to its environment in terms of economic analysis, ecology, and integrating into rural, regional and national markets. The expected outcomes will be in the form of analyzing the level of integration of this economic activity into its uncertain environment. In this way, we shall be able to identify all the risk and vulnerability factors likely to jeopardize the durability of the pastoral system. In the context of the Sahelian arid and semi-arid zones, this way of approaching pastoral risks has been considered in various manners, namely in terms of types of risks and their impacts on pastoral economy (Barton et al, 2001), assets portfolio allocation and wealth creation dynamics (Moon, 2004; Lybbert et al, 2001), mutualisation of natural risks and reduction of these through financial markets (Swift and Bass, 1999; Skees et al, 2002), etc. The starting point of this reflection involves abandoning the hypothesis of economic actors' exclusively maximizing behaviour, and taking into consideration the importance of habits, moral postures, and normalized procedures in economic decision-making. Thereafter, a refined definition of the ecological, climatic, social, and economic risks will help deepen the studies on the vulnerability of pastoralists, and define the risk covering strategies through considering the possibility for new research-development avenues: micro-insurance and micro-finance [cf. Swift (2002), Skees, Varangis, Larson & Siegel (2002), Skees (2000)].

4. Reinforcing pastoralists' capacity

Maintaining such a long lasting mode of life and of production does not preclude training pastoralists and preparing them to move towards elaborating conventions on the issue of quality, to give the pastoral label a better anchoring on the markets.

The socio-political and environmental challenges facing pastoralism

Preoccupation for environmental assets and the welfare of pastoral populations are to be the key concerns of pastoral development.

1. A better integration of pastoral populations into institutions and decision-making frames

The participation of pastoralists into decision-making processes must be reinforced because they possess know-how; they are resilient in the face of an uncertain environment; and most of all, they have sophisticated knowledge of the environment in which they evolve, and tend to improve on their "indigenous knowledge." The expected effect is a true recognition of their economic usefulness and of their role as significant contributors to the creation of national wealth.

2. A better positioning in the land tenure system

As a counterpart of the arguments on pastoral economic viability, collective and political awareness may help pastoralists to better position themselves during the on-going (or past) debates on land tenure systems in most Sahelian countries. Indeed, asserting or reasserting the importance of pastoralism and its efficacy within such environments is a relevant advocacy on the usefulness of mobility and therefore of reckoning with it in making land allocation decisions in the highly potential pastoral zones.

3. Better knowledge of the possibility for diversification through a gender approach

It is important to better understand the respective roles of men and women as well as gender-related perspectives, especially in terms of transformation or diversification.

The usefulness of conducting statistics backed economic studies

Most national structures concerned with the study of the sector tend to use statistics provided by international institutions like the FAO and the World Bank. The figures result from a rigorous construction using powerful statistics models. However, they tend to be globalizing, to such an extent that the data on pastoral economy are diluted in the data of the livestock sub-sector, which in turn are often integrated into the agricultural sector.

The very idea of conducting statistics backed economic studies indicates a willingness to confirm, through data, arguments favourable to pastoralism, which in Sahelian countries, remains a sector poor in statistics or else whose statistics are old. For the sake of illustration, we often hear about the risks facing pastoralists. One way of underscoring those risks would be to analyze the uncertainties facing this production system and mode of life, to validate

them using occurrence probabilities, and thus to determine the risk levels and their coverage modalities.

Awareness about the need to collect and make reliable pastoralism related statistics is beginning to raise among developmental research structures. In Senegal, the "Social science" team of URP Pastoralism has considered the issue and set up an important socio-economic data collection mechanism in the Ferlo silvo-pastoral zone (Senegalese Sahel). With those statistics the team will be able to better support the arguments on the economic contribution of pastoralism to the Senegalese economy and provide decision-making support tools to Senegalese authorities. In Chad, a common initiative involving public authorities and the FAO is to be launched in 2007: a comprehensive census of livestock in Chad complemented by refined statistics on pastoral activity.

The understanding and dissemination of pro-pastoralism arguments would gain more if they were backed by a dedicated international network. Hence, it is important to draw a list of resource persons and institutions likely to facilitate the exchange of data and information on pastoral economy in the Sahel (please see below).

Bibliography

Ancey V., Monas G., 2005, Le pastoralisme au Sénégal entre politique « moderne » et gestion des risques par les pasteurs, *Revue Tiers Monde*, t. XLVI, n°184, octobre-décembre, pp. 761-83

Anteneh A., 1984, Trends in Sub-Saharan Africa's Livestock Industries, in D. L. Hawksworth Ed., *Advancing Agricultural Production in Africa*, Compte rendu du Congrès CAB, Arusha, février,

Barton D., Meadows N., Morton J., 2001, Drought Losses, Pastoral Saving and Banking: A Review, DFID Advisory and Support Services Commission Project ZW 0027, NRI Project L0114, 24 p.

Baxter P. T. W., 1994, Pastoralists are People: Why Development for Pastoralists not the Development of Pastoralism?, *The Rural Extension Bulletin*, N° 4

Behnke R. H., Scoones I., 1993. Rethinking range ecology: Implications for rangeland management. In RH Behnke, Scoones I & Kerven C, *Range Ecology at Disequilibrium*. Overseas Development Institute, London, England.

Breman, H. and de Wit, C. T., 1983. Rangeland productivity and exploitation in the Sahel. *Science* 221:1341-46.

Bonfiglioli A. M., 1990, Pastoralisme, agropastoralisme et retour, in Pouillon , Bernus, *Sociétés pastorales et développement*, Cahiers des Sciences Humaines, vol. 26

Club du Sahel (OECD/CILSS), 1990, Systèmes ouest-africains de production et d'échanges en produits d'élevage, Document de Travail, SAH/D/90/351, Club du Sahel, Paris.

Debrah, S., K. Sissoko, S. Soumare, M.D. Traoré, 1988, Diagnostic de la production laitière aux environs de Bamako, Commissions techniques spécialisées des productions animales (session de juin 1989), ILCA (CIPEA)/INRZFH, Bamako, Mali.

Deramon J., de Gonneville G., Pouillon F., 1984, Evaluation de l'élevage bovin dans la zone sahélienne au Sénégal, Mission d'évaluation, Ministère des Relations Extérieures, Coopération et Développement, Mai, 127 p. + annexes

Diao A., 2001, Dynamiques socio-économiques du pastoralisme dans le Ferlo, Mémoire de fin d'étude, ingénieur ENEA / Pôle pastoral zones sèches, Dakar, 74 p. + annexes

Dicko O. I., Hamidou O., Darga A., 1994, Synthèse de données sur le Sahel Burkinabé, 137 p.

Doutressoulle G., Traoré S., 1947, L'élevage dans la boucle du Niger, *Revue d'Elevage et de Médecine Vétérinaire dans les Pays Tropicaux*, 3 (1), pp. 17-28

Duraipappah A. K., Perkins J. S., 1999, Sustainable Livestock Management in the Kalahari: an Optimal Livestock Rangeland Model (OLR), IIED, London, Working Papers Series n° 23, April, 27 p.

- Ellis J., 1999, La variabilité climatique et la dynamique des écosystèmes complexes : implications pour le développement pastoral, in Ian Scoones Dir., Nouvelles orientations du développement pastoral en Afrique. Un environnement incertain, Coédition CTA/Karthala, pp. 74-89
- Ellis J. E., Swift D. M., 1988, Stability of African pastoral ecosystems: alternate paradigms and implications for development. *Journal of Range Management* 41:450-459.
- FAO, 2004, La biodiversité agricole en Afrique de l'Ouest : Situation actuelle, expériences et perspectives, Atelier Régional sur la Biodiversité Agricole, 15-19 décembre 2003, Bamako, Mali, 288 pp.
- Gabas, J. J., 2003, Acteurs et politiques publiques, *Mondes en Développement*, 31 (124), 33-48.
- Gastellu, J. M., 1980, Mais où sont donc ces unités économiques que nos amis chercheurs cherchent tant en Afrique?, Paris AMIRA N° 26, in Cahiers de l'ORSTOM, Série Sciences Humaines, vol. XVIII, N° 1-2, 3-12
- Gningue D. I., 1995, La microéconomie en milieu transhumant. Synthèse des rapports de Schaeffer (1994), Thébaud (1994) et Tyc (1994), Etude de cas, 20 p.
- Guissard C., 1992, Les perspectives des éleveurs au Soum Burkina Faso, Mémoire d'étude, CNEARC-ASAT, Montpellier, 55 p.
- Hearne R., 1996, Review of Economic Appraisal of Environmental Goods and services With a Focus on Developing Countries, IIED: Discussion Paper DE 96-03, 28 p.
- Hill, 1999, Tangibles, Intangibles and Services: A New Taxonomy for the Classification of Output, *Canadian Journal of Economics*, Vol. 32 (2), pp. 426-46.
- Delgado, C., M, Rosengrant, H. Steinfeld, S. Ehui and C. Courbois, 1999, Livestock to 2020. The next food revolution, Food, agriculture and the environment, Discussion paper n°28, IFPRI, Washington D.C., 83 p.
- Giraud P. N., 2005, Une évaluation économique des programmes d'hydraulique pastorale au Tchad, Paris : CERNA, Ecole National Supérieure des Mines de Paris, mai, 77 p.
- Holtzman J. S., Kulibaba N. P., 1992, La commercialisation et le commerce extérieur du bétail dans le couloir central de l'Afrique de l'Ouest, 224 p.
- Holtzman, J. S., Kulibaba, M. T., 1995, La commercialisation du bétail en Afrique pastorale, in I. Scoones (ed.), Nouvelles orientations du développement pastoral en Afrique, Ed. Karthala et CTA, Paris, 1999, 149-75W
- Little P. D., 1999, Living in Risky Environments: The Political Ecology of Pastoralism in East Africa, University of Kentucky, earlier presented in "Symposium in Honor of Gwendolyn Carter, African Development in the 21st Century, Smith College Northampton, September, 40 p.
- Ly, C., 1990. Les prix de la viande bovine à Dakar: Tendance et saisonnalité de 1978 à 1987, *Revue d'élevage et de médecine vétérinaire des pays tropicaux* 43, 395-399.
- Lybbert T. J., Barrett C. B., Desta S., Coppock D. L., 2001, Pastoral Risk and Wealth-Differentiated Herd Accumulation in Southern Ethiopia, GL-CRSP Working Paper, 41 p.
- Massow, V.H. von, 1989, Dairy imports into Sub-Saharan Africa: Problems, policies and prospects, ILCA Research Report, no. 17, 1989. ILCA, Addis Ababa.
- McClintock J., 1984, Factors Affecting Output Levels from African Livestock Sectors : An Analysis of Available Data, CIPEA, Addis-Abéba, Ethiopie
- Metzel J., Cook A., 1992, Evaluation de l'avantage comparatif économique et des incitations dans le secteur de l'élevage et du commerce de ses produits dans le couloir central d'Afrique de l'Ouest, Rapport d'Evaluation, AIRD, janvier, 20 p.
- Meyer J. F., 1989, Le troupeau bovin du Burkina Faso. Résultats d'enquêtes, Rapport d'étude, 118 p.

Moon S., 2004, Pastoral Risk and Dynamic Portfolio Choice: Livestock Accumulation Patterns among ASAL Pastoralists, University of Wisconsin-Madison, Working Paper, 24 p.

Morton J., N. Meadows, 2000, Pastoralism and Sustainable Livelihoods: an emerging agenda, Social Sciences Department, Natural Resources Institute - University of Greenwich, Policy Series 11, pp. 6 – 7

O'Connor D., Turnham D., 1992, Gestion de l'environnement dans les pays en développement, OCDE : Centre de Développement, Cahiers de politique Economique, N°2, 39 p.

OULD CHEIKH Abdel Wedoud, 1985, Les Problèmes actuels du nomadisme sahélien : le cas de la Mauritanie, Bamako : Institut du Sahel, Etudes et travaux de l'USED Unité socio-économique et démographie, 115 p.

Perrier G., 1999, Nouvelles orientations dans la gestion des parcours en Afrique, in Ian Scoones Dir., Nouvelles orientations du développement pastoral en Afrique. Un environnement incertain, Coédition CTA/Karthala, pp. 91-109

Scoones I., 1999, Les nouvelles orientations du développement pastoral en Afrique, in Ian Scoones Dir., Nouvelles orientations du développement pastoral en Afrique. Un environnement incertain, Coédition CTA/Karthala, pp. 17-73

SEDES, 1975, Approvisionnement en viandes de l'Afrique de l'Ouest, Tome I – IV, SEDES, Paris

Seyoum, S., 1988, Structure de la consommation de lait en Afrique de l'Ouest, LED document de travail, no. 11, ILCA Addis Ababa, Ethiopia,.

Skees J., Varangis P., Larson D., Siegel P., 2002, Can financial markets be tapped to help poor people cope with weather risks?, World Bank: Policy Research Working Paper, WPS N° 2812, 32 p.

Skees, Jerry R., 2000, A Role for Capital Markets in Natural Disasters: A Piece of The Food Security Puzzle, Food Policy 25, 365-78

Skees, Varangis, Larson & Siegel, 2002, Can Financial Markets be Tapped to Help Poor People Cope With Weather Risks?, World Bank Policy Research Working Paper 2812, 26 p.

Swift J., 1988, Les grands thèmes du développement pastoral et le cas de quelques pays africains, Rome: FAO/ESH Working Papers on Pastoral and Agro-pastoral Societies, 83 p.

Swift, J., and Baas, S., 1999, Pastoral institutions and approaches to risk management and poverty alleviation in Central Asian countries in transition; FAO-SD website.

Toulmin C., 1986, Pertes de bétail et reconstitution du cheptel après la sécheresse en Afrique subsaharienne, Document de travail LPU N°9, CIPEA, Addis-Abéba, Ethiopie, décembre, 122 p.

Touré O. & Arpaillange J., 1986, Peuls du Ferlo, Paris : L'Harmattan, 77 p.

Tyc J., 1992, Diagnostic et recommandations en matière d'exploitation et de commercialisation de bétail et de la viande dans les provinces du Seno et de l'Oudalan, Rapport d'étude, 82 p.

Tyc J., 1995, Economie des exploitations pastorales et contribution aux économies des pays de la zone semi-aride, Rapport d'étude, 8 p

UNDP, 2004, Pastoralism and Mobility in the Drylands, The Global Drylands Imperative, p. 4

Van Ufford P. Q., 1999, Trade and Traders. The making of the Cattle Market in Benin, Amsterdam, Thela, 299 p.

Wane A. 2005. Marchés de bétail du Ferlo (Sahel sénégalais) et comportements des ménages pastoraux. Colloque SFER, 7-9 novembre 2005, Montpellier, 17 p.

Westoby, M., B. Walker, and I. Noy-Meir, 1989. Opportunistic management of rangelands not at equilibrium. J. Range Manage. 42: 266–274

Wilson R T. de Leeuw P N and de Haan C., 1983. Recherches sur les systèmes des zones arides du Mali: résultats préliminaires. Research Report No. 5. ILCA, Addis Ababa, Ethiopia.